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TREND OF MARKET PRICE AND SALES OF WHEAT DRY FODDER IN PUNJAB

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SUMMARY

Livestock are a cornerstone of rural livelihoods. With fodder area being static, farmers have to rely on dry fodder and straw as a security feed for livestock. The declining economic value of wheat straw has further rendered its ex-situ management financially unviable. In this context, a comprehensive understanding of fodder pricing trends is crucial for stakeholders in the livestock industry. The present study aims to analyse and understand the market dynamics of wheat dry fodder in Punjab state. Prices of wheat dry fodder peaked at Rs 426 per quintal in 2022–23 but declined sharply to Rs 200 per quintal in 2023-24, primarily due to the increased use of alternative feed sources such as paddy straw bales and maize silage. Majority of the farmers prefer to store wheat straw over immediate post-harvest sales and their number increased with rise in price. Though sale of wheat dry fodder takes place throughout the year, yet major share of the surplus (18%) was sold during the mid-year period. A major portion of wheat dry fodder (59.06%) was utilized on-farm, while the remaining 41% constituted a marketable surplus. This surplus was primarily sold to traders, averaging 42.52 quintals per farm. Small and medium farmers used it mainly for their own livestock consumption while large farms had the highest share in sales to traders. Understanding the disposal of dry fodder is essential not only for promoting sustainable agriculture but is also crucial for ensuring food security, boosting livestock production, understanding resource management and exploring economic opportunities.

Key words: Dry fodder, farm category, livestock, price, sales, wheat

Livestock is the backbone of Indian agriculture contributing about 4 per cent to national GDP and about one-fourth share in agricultural GDP. India supports nearly 15 per cent of the world's livestock population, despite covering only 2.4/ per cent of the global land area. Further, milk production is highly dependent on the availability and affordability of quality feed and fodder (Grover and Kumar, 2012; Singh *et al.*, 2018). As per recommendations of the National Commission on Agriculture, a minimum 10 per cent of the arable area in the country (about 16.5 million ha) should be under improved fodder crops to meet the green fodder requirement but the area under fodder production has been static for last two decades *i.e.*, around 8.4 million ha due to globalization and growing population. As a result, farmers have to feed livestock with dry fodder and straw as a security feed. Wheat is a major component of crop livestock systems which supply much of the world's food and support millions of small farmers globally (Herrero *et al*., 2009). Rice straw and wheat straw constitute 64.37 per cent of the total feed resources at the national level (Duncan *et al.*, 2020). Wheat dry fodder is the only fibrous residue transported to and from distant markets. It is sold and bought all over Northern India and farmers not only keep a significant portion of their gathered fodder but also exchange enormous amount of fodder, both locally and across greater distances. Samireddypalle *et al*. (2019) calculated that at national level, wheat straw contributed about 15 per cent to feed dry matter with the contribution being negligible in many Southern states but reaching 43.7 and 38.9 per cent in Haryana and Punjab, respectively.

In Punjab, livestock is one of the most important aspects of state's economy, accounting for 10.47 per cent of the Gross State Value Added (GoP 2024). Small landholders and landless rural poor households rely heavily on livestock for supplementary income and sustenance. Changing land use patterns due to intensive and commercialized agricultural and

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development activities have affected the cattle raising patterns, which are transitioning from grazing to stall feeding because of declining forest area, fallow, and grazing grounds. Increased money and growing urbanization have boosted the commercialization of the dairy business (Singh *et al*., 2013). Several states have common property resources (CPR) for meeting the fodder requirements through grazing, but in Punjab, animals are generally stall-fed due to disappearance of these grazing grounds (Sharma, 2017). In the state, wheat is the *rabi* season crop cultivated on 35.18 million ha area with production of 18.16 million metric tonnes during 2023-24 (GoP 2024) and its by-product in form of wheat dry fodder (*turi*) is a key ruminant feed source. Wheat straw is a major source of dry matter in dry fodders contributing 80.52 per cent in total dry matter availability in the Punjab state (Tanwar and Verma, 2017). As per 20th Livestock Census-2019, the total livestock population in Punjab is 70.5 lakh, out of which 65.5 lakh are bovines which are to be provided sufficient quantity of good quality fodder.

Fodder trading is also an important livelihood activity for the poor who engage in it directly or who are employed in this value chain (Singh *et al*., 2015). In the states of Punjab and Haryana, the status of fodder has been reported as surplus for green fodder and dry fodder by 133.05 per cent and 31.70 per cent, respectively (Roy *et al*., 2019). Punjab contributes significantly to the supply chain by exporting wheat dry fodder to neighbouring states. Inter-state trade of wheat dry fodder plays a pivotal role in meeting the fodder requirements of regions facing shortages or limited wheat cultivation. Collapse of economic value in wheat dry fodder has made its ex-situ management economically unviable. Because of this the Government might also face a peculiar and difficult situation after wheat harvesting (Teja, 2025). With this backdrop, the present study was carried out to have a comprehensive understanding of the sales pattern so that effective strategies can be developed to mitigate these constraints effectively and enhance the wheat dry fodder trade.

MATERIALS AND METHODS

The cross-section data pertaining to the agricultural year 2018-19 to 2023-24 were taken from the data collected under centrally sponsored 'Comprehensive scheme to study the cost of cultivation of principal crops in Punjab' operating in the Department of Economics and Sociology, Punjab Agricultural University, Ludhiana for the present study. The data were collected from a sample of 300 farm households in 30 tehsils spread across the three agro-climatic zones (cotton/paddy-wheat i.e. zone I; paddy/maize-wheat i.e. zone II and paddy-wheat *i.e*. zone III) of the Punjab state. From each zone, farmers were selected using three-stage stratified sampling technique, with tehsil as stage one, a village/cluster of villages as stage two and operational holdings within the clusters as stage three. Requisite information related to sales of wheat dry fodder to different destinations i.e sales at farm, to village merchant/trader/neighbours and to mandi was collected and analysed over the time period.

Further, data relating to post-harvest handling, storage and disposal in terms of quantity in sales of wheat dry fodder during 2023-24 were collected through primary survey method from 90 farmers from the three agro-climatic zones i.e. 30 from each zone (Fig. 1). The data was analysed using averages, percentages and other tools like tables, charts and diagrams.

RESULTS AND DISCUSSION

Wheat is a *Rabi* season crop which is sown during October -November and harvested between March-April. Wheat, a dual-purpose crop, is valuable for both grain and fodder production. Post-harvest, the wheat straw serves as a significant source of dry fodder for livestock. The price of fodder is influenced by several key factors, including its availability, demand for livestock feed, seasonal variations, and the cost of production. Additionally, its quality, area's cropping patterns and livestock density also play a vital role. Availability in both quantity and quality is one of the most limiting factors in boosting livestock productivity (Birthal and Jha, 2005). In Punjab, wheat straw is the primary roughage -used by over 42% of straw-using households-making its availability and quality crucial

A. Trend of price of wheat dry fodder

The price of wheat dry fodder in Punjab has shown huge fluctuations over the past six years (2018-19 to 2023-24). Analysis of data over the time period revealed that the average price of wheat dry fodder in Punjab state has declined. The average price of the dry fodder was Rs 378 per quintal during 2021-22 and further increased to Rs 426 per quintal during 2022-23 but drastically declined to Rs 281 per quintal during 2023-24 (Fig. 2).

During present season i.e. 2024-25, the

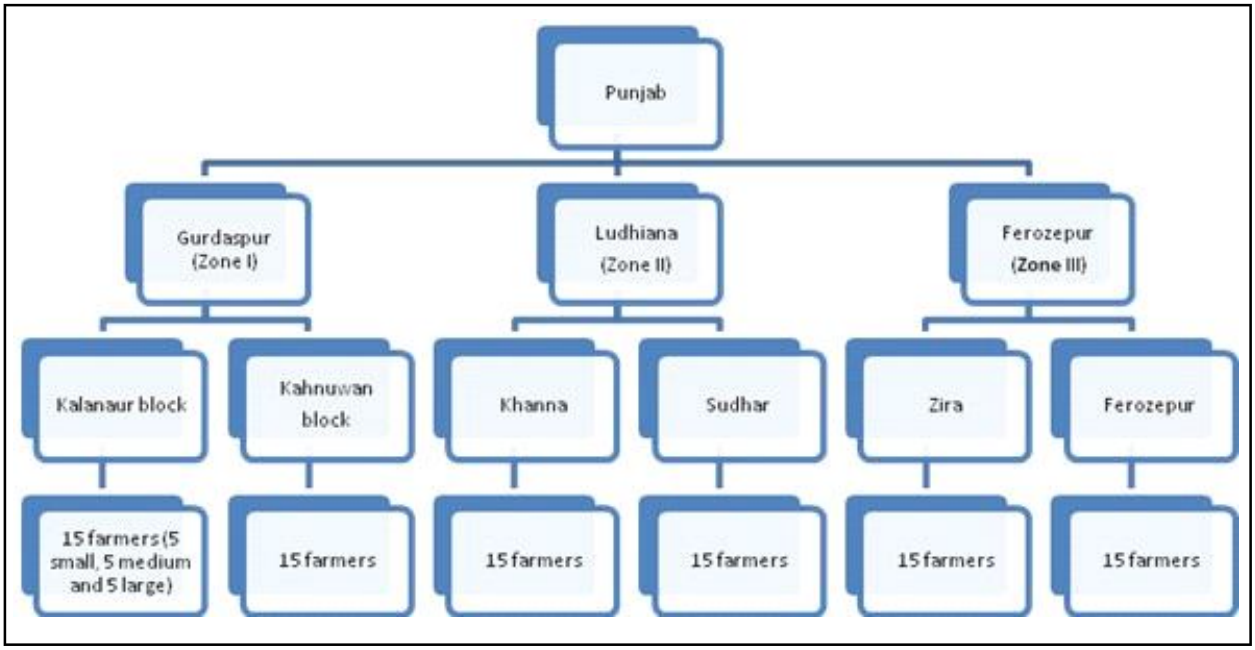

Fig. 1. Sampling design for selection of respondents.

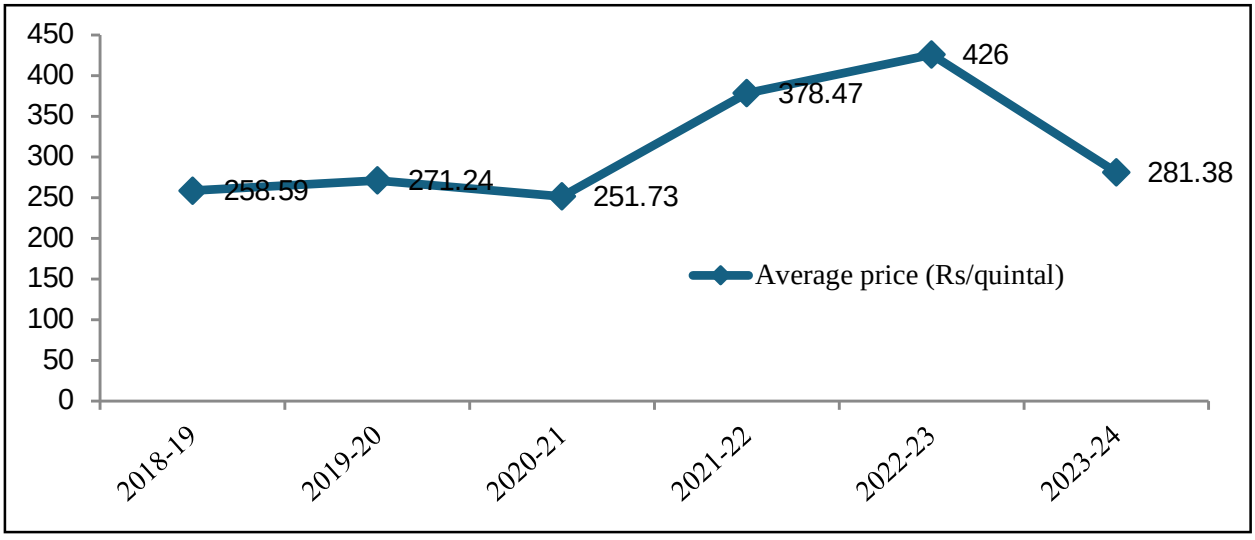

Fig. 2. Average Price of wheat dry fodder in Punjab.
Source: Department of Economics and Sociology, Punjab Agricultural University.

farmers were feeling difficulty in finding any buyers even for Rs 200 per quintal. The major reason behind this decline is the decrease in the number of cattle and buffalo. The recent preliminary animal census by the government has revealed that the number of cattle and buffalo, in particular, has decreased by 2.32 lakh and 5.22 lakh, respectively, compared to the previous 2019 animal census. Another reason for higher prices of wheat dry fodder during 2022-23 was its use in industry as fuel which had further pushed the prices up. Industrial consumers and farmers are increasingly turning to paddy straw bales as fuel and fodder, replacing the wheat dry fodder. With paddy bales gaining more popularity, the inter-state trade of wheat dry fodder has declined. Additionally, the increasing adoption of maize silage, which is more nutritious and easier to digest, requiring lesser labour has led to reduced demand for wheat straw as fodder.

B. Disposal pattern of wheat dry fodder

Disposal pattern means the different pathways by which wheat straw is utilised by the farmers. These patterns are mainly influenced by fodder market

dynamics, farmers' profitability, and cropping timelines. Wheat straw is a major source of dry matter in the dry fodder in the state. The farmers mainly used the wheat dry fodder for consumption at own farm from the storage along with sales to village merchant/middlemen, neighbours to co-villagers, dairy farms and traders or at market. Information about the sales pattern of wheat dry fodder is shown in Table 1 and Fig. 3.

Analysis of data revealed that in the state, majority of the farmers sowing wheat prefer to store wheat straw than to sell it immediately. It was also observed that the number of farmers storing the wheat straw increased with rise in its price i.e. from 85 per cent to 85.5 per cent during 2022-23 when the average price of wheat straw was the highest i.e. Rs 426 per quintal. On the other hand, their number declined to only 75 per cent in 2023-24 when the average price of wheat straw decreased to Rs 281 per quintal. This price disparity discourages farmers from investing in straw storage.

C. Sale of wheat dry fodder at different time intervals

Sale of wheat dry fodder takes place throughout the year at different time intervals. The year is divided into four time-intervals: immediate after production, post-harvest period (April to July), mid-year period (August to November) and lean period (December to March). It was observed that major portion of wheat dry fodder 91.86 quintals (59.06%) was consumed at own farm and remaining 63.68 quintals (40.94%) remained as marketable surplus (Table 2 and Fig. 4). Out of the wheat dry fodder sold, about 18 per cent was sold during the mid-year

TABLE 1
Sales pattern of wheat dry fodder followed by respondents in Punjab

Year/Category	Sold		Stored		Overall	
	Average price (Rs./q)	No. of farmers	Average price (Rs./ql)	No. of farmers	Average price (Rs./ql)	No. of farmers
2018-19	263.11	123 (20.7)	257.41	471 (79.3)	258.59	594
2019-20	291.27	124 (21.3)	266.74	457 (78.7)	271.24	581
2020-21	261.99	138 (22.0)	248.86	490 (78.0)	251.73	628
2021-22	377.02	87 (15.0)	378.73	494 (85.0)	378.47	581
2022-23	395.99	80 (14.5)	417.61	472 (85.5)	426.00	552
2023-24	293.54	140 (25.5)	277.22	408 (74.5)	281.38	548

Source: Department of Economics and Sociology, Punjab Agricultural University.
Note: Multiple response; Figures in parentheses are percentages to total number of farmers.

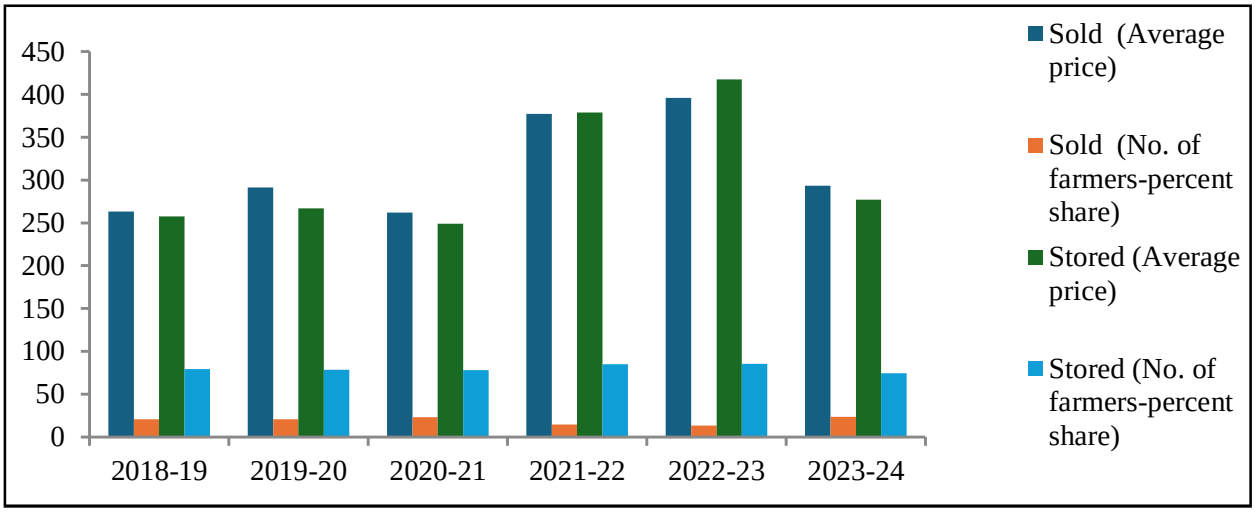

Fig. 3. Sales pattern of wheat dry fodder in Punjab.
Source: Department of Economics and Sociology, Punjab Agricultural University.

TABLE 2
Sale of wheat dry fodder at different time intervals in Punjab, 2023

Category	Farm category			Quantity (Quintal/farm/annum)	Average price (Rs./quintal)
	Small	Medium	Large		
Immediately after production	1.72 (3.77)	2.91 (2.74)	-	1.42 (0.81)	303.5
Post harvest period (April-July)	-	7.94 (7.46)	40.63 (13.03)	20.78 (13.36)	334.4
Mid-year period (August-November)	3.89 (8.48)	10.95 (10.29)	60.83 (19.48)	28.05 (18.04)	502.6
Lean period (December-March)	2.12 (4.65)	3.35 (3.15)	29.38 (9.42)	13.43 (8.63)	671.8
Consumed at own farm	37.90 (83.10)	81.20 (76.36)	181.13 (58.06)	91.86 (59.06)	-
Total	45.63 (100.00)	106.35 (100.00)	311.97 (100.00)	155.54 (100.00)	453.075

Source: Field Survey.
Figures in the parentheses are percentages to their respective totals.

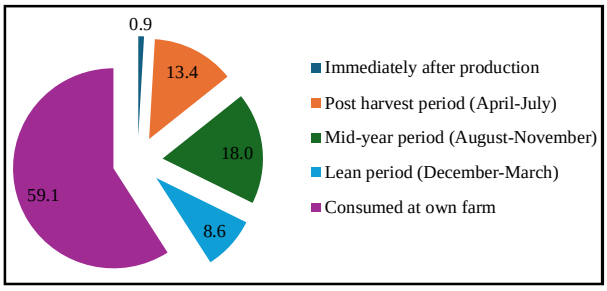

Fig. 4. Sales pattern of wheat dry fodder over different time intervals in Punjab.
Source: Field Survey.

period (August to November), followed by 13.36 per cent in post-harvest period (April to July), 8.63 per cent in lean period (December to March) and 0.81 per cent immediately after production. Major share of wheat dry fodder was sold in mid-year period (August to November) because the demand of wheat dry fodder is higher at this time interval and price is also higher.

Farm category wise analysis revealed that at large farms, about 58 per cent of wheat dry fodder produced was consumed and at medium and small farms it was 76.36 and 83.10 per cent, respectively. It indicates that small and medium farmers use wheat dry fodder mainly for their own livestock consumption.

D. Price of wheat dry fodder at the time of sale

The price of wheat dry fodder varies at different time intervals. At overall, the price of wheat dry fodder was highest (Rs. 671.8 per quintal) during the lean period (December to March), followed by Rs. 502.6 per quintal during mid-year period (August to November), Rs. 334.4 per quintal during the post-harvest period (April to July) and Rs. 303.5 per quintal at the time of wheat harvesting (Table 2).

Sale of price of wheat dry fodder is higher during mid-year period (August to November), and lean period (December to March) as the demand of wheat dry fodder is high. The price at lean period remains higher than mid-year period because of less

TABLE 3
Consumption of wheat dry fodder in Punjab

(Quintals/farm/annum)

S. No.	Particulars	Farm size category			Overall
		Small	Medium	Large	
A	Total on farm consumption*	37.90 (83.10)	81.20 (76.36)	181.13 (58.06)	91.86 (59.06)
1	Sold to traders	3.99 (51.62)	14.11 (56.1)	98.52 (75.3)	42.51 (66.76)
2	Sold to dairy Farms	-	5.30 (21.07)	21.74 (16.62)	12.97 (1.4)
3	Sold to co-villagers	3.74 (48.38)	5.74 (22.82)	10.58 (8.09)	8.20 (12.88)
B	Sold*	7.73 (16.90)	25.15 (23.65)	13.084 (41.94)	63.68 (40.94)
C	Total (A+B)	45.63 (100.00)	106.35 (100.00)	311.97 (100.00)	155.54 (100.00)

Source: Field Survey.
Figures in the parentheses are percentages of their respective totals.
*percentages have been taken from the total (C).

stock of wheat dry fodder available. Overall, the table provides a snapshot of the variability in wheat dry fodder sales across different time intervals in Punjab, illustrating price fluctuations and seasonal trends in market behaviour.

E. Consumption pattern of wheat dry fodder

Wheat dry fodder is primarily sold to destinations including urban and peri-urban areas, local markets, and to businesses dealing with animal feed, such as dairy farms and *gaushalas* (cow shelters). Some farmers also sell directly to other farmers, sometimes through barter systems.

Further analysis of data revealed that about 59 per cent wheat dry fodder was consumed at own farm by the respondents with rest 41 per cent being sold up. Majority of the wheat dry fodder *i.e.* was sold to traders (42.52 quintals/farm) followed by dairy farms (12.97 quintals/farm) and to co-villagers (8.20 quintals/farm). Large farms had the highest percentage of sales to traders, followed by medium farms, and small farms.

CONCLUSION

Understanding the disposal of dry fodder is essential not only for promoting sustainable agriculture but is also crucial for ensuring food security, boosting livestock production, understanding resource management and exploring economic opportunities. To support farmers and curb burning, it is necessary to consider policies that revive livestock numbers via dairy incentives or promoting backyard animal husbandry; creating market pull for wheat dry fodder/ straw via biomass plants, biofuels, packaging or structured fodder markets; subsidizing fodder processing or support cooperative straw-collection systems. Addressing the decline in wheat straw storage requires a multifaceted approach involving economic incentives, market diversification, and farmer education to ensure sustainable agricultural practices and environmental stewardship.

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